Pengaruh Paparan Musik Mozart pada *Rattus norvegicus in utero* terhadap Ekspresi *Protein Kinase B* (Akt) dan Indeks Apoptosis Neuron di *cerebrum* Anak Tikus Baru Lahir

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ABSTRAK

Latar Belakang: Penelitian tentang pengaruh stimulasi musik Mozart sebelumnya banyak yang menyatakan bahwa kombinasi stimulasi dan nutrisi menghasilkan parameter potensi kecerdasan yaitu peningkatan jumlah sel neuron, menurunnya indeks apoptosis neuron secara bermakna pada hewan coba dan ibu hamil. Penelitian ini bertujuan mengetahui perbedaan ekspresi Protein Kinase B (Akt) dan indeks apoptosis neuron pada otak *Rattus norvegicus* baru lahir di *cerebrum* dengan paparan musik Mozart dan dengan tanpa paparan musik Mozart yang merupakan lanjutan dari serangkaian penelitian dalam upaya meningkatkan tumbuh kembang otak yang diharapkan dapat memberikan hasil peningkatan kecerdasan bayi dalam rahim.

Tujuan: Membandingkan ekspresi Protein Kinase B (Akt) dan indeks apoptosis neuron pada otak *Rattus norvegicus* baru lahir di cerebrum dengan paparan musik Mozart dan dengan tanpa paparan musik Mozart.

Metode: Penelitian analitik eksperimental dengan desain *single blind randomized post test only control group* menggunakan hewan coba *Rattus norvegicus* di kandang hewan coba Fakultas Kedokteran Hewan Universitas Airlangga. Kelompok hewan coba dibagi dua yaitu kelompok kontrol tanpa diberi perlakuan dan kelompok perlakuan diberi paparan musik Mozart saat kebuntingan hari ke-10 setelah mendapatkan persetujuan dari komite etik. Kami menggunakan uji komparasi dan korelasi dalam analisis pada ekspresi Protein Kinase B dan indeks apoptosis neuron.

Hasil penelitian:

Di *cerebrum* didapatkan perbedaan secara bermakna ekspresi Protein Kinase B (Akt) dengan nilai p= 0,039 (mean 4,65 ± 1,53 pada kelompok kontrol dan 6,51 ± 2,34 pada kelompok perlakuan), didapatkan perbedaan secara bermakna indeks apoptosis neuron dengan nilai p= <0,001 (10,09 ± 1,69 pada kelompok kontrol dan 4,28 ± 1,82 pada kelompok perlakuan). Didapatkan korelasi negatif antara ekspresi Protein Kinase B (Akt) dengan indeks apoptosis neuron (nilai p= 0,038; r = -0,445)

Kesimpulan: Pemberian musik Mozart dapat menyebabkan peningkatan ekspresi Protein Kinase B (Akt) dan penurunan indeks apoposis neuron di *cerebrum*. Didapatkan hubungan negatif antara ekspresi Protein Kinase B dengan indeks apoptosis neuron.

Kata Kunci: Musik Mozart, paparan, Protein Kinase B (Akt), indeks apoptosis neuron, *Rattus norvegicus*.

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The effect of Mozart music to *Rattus norvegicus in utero* with the expression of *Protein Kinase B* (Akt) and Apoptosis Index of Neuron in the *cerebrum* of the newborn *Rattus norvegicus*

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ABSTRACT

Background: Previous studies about Mozart stimulation stated that the combination of stimulation and nutrition resulted in intelligence potential parameter such as the significance increase of neuron cells and the decrease of apoptotic index of neuron in both animal subjects and pregnant women. This study has a goal to find out the difference of Protein Kinase B (Akt) expression and apoptotic index of neuron in the *cerebrum* of newborn *Rattus norvegicus* between groups that were exposed to music of Mozart and those without the exposure of music of Mozart. This study is a part of several research series which aim to increase growth and development of the brain, to be expected to give the result of the increase of babies intelligence since pregnancy.

Aim: To compare the expression of Protein Kinase B (Akt) and apoptotic index of neuron in the *cerebrum* of the newborn *Rattus norvegicus* between groups that were exposed to music of Mozart and those without the exposure of music of Mozart.

Methods: Analytical experimental study with single blind randomized post test only control group design using animal subjects *Rattus norvegicus*. This study was performed in animal laboratory Faculty of Veterinary Medicine Airlangga University. Animal subjects were separated into two groups which were control group and a group which was exposed to the music of Mozart since *in utero* day-10 after gained ethical clearance from the ethic committee. We used comparation and correlation test in the analysis of the expression of Protein Kinase B and apoptotic index of neuron.

Results: There was a significant difference of the expression of Protein Kinase B (Akt) with p value = 0,039 (mean 4,65 ± 1,53 in control group and 6,51 ± 2,34 in exposure group). There was a significant difference of the apoptotic index of neuron with p value = <0,001 (10,09 ± 1,69 in control group and 4,28 ± 1,82 in exposure group). There was a negative correlation between Protein Kinase B (Akt) expression and apoptotic index of neuron (p value= 0,038; r = -0,445)

Conclusion: The exposure of Mozart music to *Rattus norvegicus in utero* resulted in the increase of Protein Kinase B (Akt) expression and the decrease of apoptotic index of neuron in the *cerebrum*. There was a negative correlation between the expression of Protein Kinase B and apoptotic index of neuron.

Keywords: Mozart, Protein Kinase B (Akt), Apoptotic index of neuron, *Rattus norvegicus*.

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